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ABSTRACT

This study seeks to determine whether there are syntactic differences in the ways in which field dependent and field independent individuals write, and to determine whether these differences can account for the differences in interpersonal evaluations. One hundred sixty-five subjects were selected for this study by randomly selecting classes from the 1975 Speech Communication Department list of offerings, from three lower division theater department courses, and from a summer mathematics seminar for high school students. The data produced by the subjects employed in this study was examined by the Syntactic Language Computer Analysis II (SLCA II). The results of the study were inconclusive, but the analysis produced some unexpected findings. These findings point to the need for more research. (An extensive discussion of the data is presented and the data is also presented in table format.) (RB)

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A STUDY OF THE EFFECTS OF MESSAGES ENCODED BY FIELD DEPENDENT AND FIELD INDEPENDENT SOURCES IN AN EDUCATIONAL SETTING

A Paper Presented to
The Instructional Communication Division
of the
International Communication Association

by
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A STUDY OF THE EFFECTS OF MESSAGES ENCODED BY FIELD DEPENDENT AND FIELD INDEPENDENT SOURCES IN AN EDUCATIONAL SETTING

Cognitive style is a mediating variable in the educational process. On the college level it functions in areas from choice of major to actual academic success; further, it functions indirectly by apparently confounding the communication process. The extent to which communication compounds the other effects is unclear. The suspicion is strong, however, that if the communication effects could be controlled, academic success, regardless of cognitive style, would be enhanced. Shows (1967) notes that in addition to liking one another more, individuals matched for cognitive style reported it "easier to understand" (italics mine) each other than unmatched individuals. The question arises, could field dependent students wishing to major in traditionally field independent disciplines such as the physical sciences reach a higher level of success if they could "understand" their field independent instructors better, or if their instructors understood them better?

To test such a notion would require a well-constructed series of investigations focusing on communication and cognitive style. So far this has not been done. The study described here provides but one link, though a necessary one, in such an investigation. It focuses on written messages variables not yet examined in the cognitive style literature, and it does so in relation to issues significant for the field of education, i.e., variables which might affect the teacher-student relationship which in turn might affect the success of the educational process.

Statement of Problem

Field dependence-independence, originally conceptualized by H. A. Witkin and his associates as an unidimensional continuum of perceptual style which crosses sense modalities (Axelrod, and Cohen, 1961; White, 1953), is now seen to be a pervasive mode of cognitive functioning encompassing perceptual, intellectual, and personality dimensions.

Perceptually, the field dependent individual has difficulty disembedding an object from an embedding context. Intellectually, the field dependent individual finds problems "in which an essential element required for solution must be isolated from the context in which it is presented and used in a different structuring of the problem material," (Witkin and Oltman, 1967, p. 130) hard to solve. This is not the case with the field independent individual. Both the perceptual and intellectual tasks described above are comparitively easy for him.

There are also marked personality differences between the two. In general, individuals who show an articulated, field independent, or analytic cognitive style in perceptual tests and intellectual functioning are likely to display a more articulated body concept (Epstein, 1957; Silverman, Cohen, Shmavonian and Greenberg, 1961; Witkin, et al, 1962), have a greater sense of separate identity -- that is have a greater awareness of their own needs, feelings and attributes distinct from those of others (Konstadt and Foreman, 1965; Linton, 1955; Messick and Damarin, 1964; Witkin, 1962; Winestine, 1964), and use specialized defenses such as isolation (Bertini, 1961) as opposed to relatively nonspecific defense mechanisms as massive repression and primitive denial used by field dependent individuals (Witkin, 1965).

These differences between a more articulated cognitive style and a more global cognitive style are manifestations of even greater differences between a more developed and a less developed psychological differentiation.

Implications for Communication Research

Evidence suggests that opposites "repel" in the case of field dependent and field independent individuals. Studies from clinical psychology and psychiatry indicate that therapy is most effective when therapist and client are matched for cognitive style rather than unmatched, since the kind of interactions and best methods of analysis for each differs (Greene, 1972; Witkin, et al, 1968). Shows (1967) created an interview situation in which the task for the interviewer was to find out as much as possible about the interviewee. He then analyzed the results of a questionnaire filled out by both interviewer and interviewee. He found that partners matched for cognitive style "found it easier to understand each other, were more interested in each other, and . . . viewed each other as more sympathetic" (Witkin, 1972, p. 35) than unmatched pairs. This effect occured after only twenty minutes of interaction. DiStefano (1969) found that teachers and students matched for cognitive style rated each other in highly positive terms; the opposite occured for mismatched subjects. In addition, teachers valued more highly the intellects of students with cognitive styles similar to their own; the same was true for students. In a study by Lewis, Weil and Witkin (1968), similar effects were found after only twenty-five minutes of interaction. The implications for communication research are clear.

Is there something about the interaction between field dependent and field independent individuals which prompts them to make consistently negative evaluations about each other? Is there something in the interactions between individuals of matched cognitive style that encourages them to make positive evaluations of each other? Witkin (1972) suggests three reasons why persons matched in cognitive style tend to evaluate each other positively: 1) they have the same interests; 2) they have similar personality traits; 3) they share similar communication modes. This third suggestion is not so much on "why" individuals say something or act in a certain way, i.e., send specific messages, but rather on "what" is said (sent) and/or "how" it is said.

While some research focusing on relationships between cognitive style and communication variables has been conducted (see Witkin, 1972, for a summary), an area yet to be explored in this context is the degree of syntactical similarity/dissimilarity in the messages of field dependent and field independent individuals and its effect, if any, on interpersonal attraction and evaluation. One study dealing with a similar cognitive style produced indications that a relationship between syntax and cognitive style does exist (Hess and Shipman, 1965). The possibility that differences of verbal variables, particularly syntax, are highly correlated with differences in cognitive style needs further exploration in many settings.

Implications for Education Research

It is no accident that current interest in field dependence-independence has spread to the field of education, for it is here, as Witkin (1972) suggests, that the implications for research are strongest and most promising. Consider the following:

1. There is a clear relationship between cognitive style and academic and vocational choices. Field independent students gravitate toward areas requiring analytical skills, i.e., the sciences (biological and physical), mathematics, engineering, technical and mechanical activities. Field dependent individuals choose areas of concentration in which interpersonal relations and day-to-day involvement with people are required (Chung, 1966; Clar, 1971; DeRussy and Futch, 1971; Glatt, 1969; Krienke, 1969; Linton, 1952; Pierson, 1965; Witkin, 1972; Zytowski, Mills, and Paepe, 1969).
2. There is a clear relationship in the direction expected between cognitive style, achievement, and subject matter (Witkin, 1972).
3. The ease with which students make educational and vocational choices is related to cognitive style. It appears that field independent individuals are "more realistic in their educational choices and more articulated in vocational interests" (Clar, 1971).
4. As a group, individuals favoring teaching as a profession tend to be field dependent (Witkin, 1972). Within specific domains the expected trend is found: teachers in science or mathematics are likely to be field independent (DiStefano, 1969).
5. Teaching strategy appears to be related to cognitive style. Field dependent teachers prefer discussion or discovery methods rather than lecturing methods which are preferred by more field independent teachers (Wu, 1967).
6. There is some indication of an interaction between learning, subject matter, and teaching strategy which may override the effects of cognitive style (Rennels, 1970).
7. The amount of knowledge gained by students under varying teaching methods tends to be related to their cognitive style (Grieve and Davis, 1971).
8. Match or mismatch in cognitive style between teacher and student has a striking effect on their interpersonal perception of each other. A match produces mutually high praise; a mismatch

produces mutually negative evaluations (DiStefano, 1969).

A myriad of research questions can be generated from the information presented above, and many have. But to date, the largest share of research into the relationship between cognitive style and education has centered in young children. Much more needs to be done at the college level. Studies of students in higher education designed to explore the interactions between cognitive style, communication, and education variables would have great impact on the field of education. Such studies would help shed more light on the nature of teacher-student interactions which might ultimately help explain academic success or failure with more precision.

Objectives

No study of field dependence has specifically studied the effect of cognitive style on syntax, nor the effect of syntax in this regard on interpersonal attraction. Could such a relationship exist? The Hess and Shipman study (1965) and the Bernstein material on which it draws at the very least suggest stylistic differences between the language used by individuals of varying cognitive styles. Could such differences affect interpersonal evaluations? If that occured, could it affect the educational process? Could the way in which an instructor explains the subject matter account in part for the degree to which students understand it? The Shows study (1967) indicates such a notion. This study seeks to examine two parts of this issue.

First, it seeks to determine whether, in fact, there are syntactic differences in the way in which field dependent and field independent individuals write, and second, to determine whether these differences, if they exist, can account for the differences in interpersonal evaluations cited earlier. In addition, it checks the notion, though indirectly, that the academic subject matter chosen by a student is related to cognitive style. The specific variables treated in this study are examined below.

Independent Variables

Field dependence-independence. Each subject completed Form III of the group Embedded Figures Test developed by Jackson, Messick, and Myers (1964) to determine his degree of field dependence-independence. The authors report within-group correlations between the individual EFT (one of the three original measures) and group Form III of .62 for men and .56 for women ($p < .01$). The reported Kuder Richardson 21 reliability coefficient for Form III was .71.

Analytical reasoning. The Wechsler Adult Intelligence Scale Block Design subtest was administered to randomly selected subjects from the subject population as a measure of their analytical reasoning ability (Goodenough and Karp, 1961).

Research indicates that field independent individuals perform better on this and two other subjects in the Wechsler Closure subtest group than field dependent subjects. Karp (1963) reported a factor loading of .66 for the Block Design subtest on a field

dependence-independence factor. The results of this test provide us with a check on previous findings concerning field dependence-independence and analytical reasoning and a further indication of the degree of field dependence for each subject.

American College Test scores. As a control for general intelligence of subjects and a comparison point for each subject's self evaluation of knowledge level, the ACT scores for each subject on file at the University were checked.

These three independent measures define the non-demographic parameters of the subject population. They also provided a check on the intellectual characteristics previously found to correlate highly with the field dependence-independence continuum.

Dependent Variables

Message content. Subjects were asked to create an essay in which they explained to an unknown reader "how" something is done in one of three specified areas: the fine arts, the social sciences the physical or applied sciences. It was anticipated on the basis of results of studies cited earlier that choice of subject matter for this essay was a function of cognitive style.

Message syntax. A major criticism of the few content analysis studies dealing with field dependence-independence concerns the inadequacy of both the categories used for analysis and the rationale for selecting them. The Doob (1958) study is typical. The categories used were traditional grammatical units and little rationale for their use as units of analysis of field dependence encoding behavior was provided. In addition, such an analysis is less than complete. Perhaps one reason so little has been found in this area is because so little has been examined. The method of analysis utilized in this study avoids these criticisms. SLCA-II provides a more complete set of categories for analysis and a theoretic rationale for its use in the analysis of messages produced by field dependent-independent sources.

It has been suggested (Cummings, 1970; Cummings and Renshaw, 1975) that a fruitful method of analyzing linguistic differences between messages is to examine them syntactically using a category system based on "an operationally adequate but scientifically meaningful classification of signs and sign-to-sign relationships" (Cummings, 1970, p. 24). Such a classification system finds its roots in functional approaches to the study of verbal behavior which recognize that the structural components of messages as well as specific content words contribute to the pooled meaning of a message (Cummings and Renshaw, 1975).

The traditional approach to the content analysis of messages is to examine the message for specific content words. Content analysis studies in psychology or communication using a system of syntactic categories are rare. Cummings (1970) cites only three. A review of the cognitive style literature produced none. This suggests a productive area for exploration.

Combining the need for an "operationally adequate but scientifically meaningful" system of syntactic analysis with the efficient and expedient technique of computer analysis, Cummings and Renshaw (Cummings and Renshaw, 1975) have developed a computerized system for the syntactic analysis of language. The

program (Syntactic Language Computer Analysis II) draws upon categories from traditional grammatical taxonomies and from the propositional relationships used in formal logic (Cummings, 1970; Cummings and Renshaw, 1976).

One aspect of this program does need special mention since it deals directly with expected differences between messages produced by field dependent and field independent sources. SLCA-II discriminates between subject signs (subjects and objectives of verbs in the message corpus) and limiter signs (adjectives, adverbs, and objects of prepositions which modify subject signs) which are afferent (denoting persons, places, qualities or things which can be sensed) and those which are efferent (persons, places, qualities and things which cannot be sensed) (Cummings and Renshaw, 1975). The distinction is drawn between words with external referents (afferent) and words with internal or nonsensory referents (efferent). Such a distinction finds an easy parallel with the following statements by Witkin.

In describing the differences between field dependent and field independent individuals in relation to their views of self, Witkin (1965) notes that field independent individuals have:

> . . . a developed sense of separate identity. . . which implies experience of the self as structured; internal frames of reference have been formed and are available as guides for definition of the self. The less developed sense of separate identity of persons with a global cognitive style manifests itself in reliance on external sources for definition of their attitudes, judgments, sentiments, and of their views of themselves (pp. 320-321).

Would these differences manifest themselves in terms of Cummings' afferent-efferent distinction? If so, how?

A second reason for using SLCA-II in this study was found in the original study utilizing SLCA. When Cummings (1970) was developing the categories now used in SLCA-II, he examines the relationship between spatial orientation in reasoning ability and message syntax. While the flexibility of closure tested in Form III of the group embedded figures test is not the same variable, they share conceptual similarity (Allport, 1955; Thurstone, 1944). It was expected that the syntactic categories in the Cummings study (1970) would predict field dependence-independence at least as well as they discriminated spatial orientation.

Self evaluations. After generating their messages, the subjects were asked to evaluate themselves on both a knowledgeability-expertise and an interest-in-subject matter scale constructed for this study. The knowledgeability-expertise scale is an adaption of the McCroskey "authoritativeness" semantic differential (McCroskey, 1966). The interest in-topic scale was constructed from the six polar adjective pairs which loaded most highly on the evaluation factor identified in the original Osgood, Suci, and Tannenbaum studies plus four irrelevant pairs (Osgood, et al, 1971). These results were compared with the three independent measures to determine the amount of discrepancy between what was expected of the subject and his own view of himself.

Source evaluations. Subjects, after exposure to a message produced by either a field dependent or a field independent source evaluated the sources on the source evaluation form adapted for this study. The original scale was a teacher-evaluation scale developed by William E. Holdridge from the McCroskey studies (Holdridge, 1972).

Content evaluations. Subjects rated their interest in the content of the message to which they had been exposed by completing the message content evaluation form. This scale is the semantic differential instrument devised by John B. Carroll for judging prose style (Carroll, 1969).

Empirical Expectations

Given such a set of independent and dependent variables with which to work, what might one expect to find? The following is a list of anticipated findings:

1. Characteristics syntactic categories, as identified by the SLCA-II program, will emerge as a result of the content analysis of messages produced by field dependent and field independent subjects. Specifically, a comparison of the word index values of the following syntactic categories in messages produced by field dependent and field independent sources will be significantly different ($p < .05$):

TOT-1 (total words encoded)
ClP (total connectors which have no modifiers)
Sl-A (total subject words which are judged afferent)
Sl-E (total subject words which are judged efferent)
LSl-E (total modifiers of subject words which are judged efferen
LSl-A (total modifiers of subject words which are judged afferen
LCl-A (total modifiers of connectors which are judged afferent)
LCL-E (total modifiers of connectors which are judged efferent)
ICE (total comparison-equivalence connectors)
IT (total action connectors which are transitive, indicative)
IR (total action connectors which are intransitive, indicative)
NSl-A (total negated subject words which are afferent)
NSl-E (total negated subject words which are efferent)
NLSl-A (total negated subject word limiters which are afferent)
NLSl-E (total negated subject word limiters which are efferent)
NLCl-A (total negated connector limiters which are afferent)
NLCl-E (total negated connector limiters which are efferent)
S-S (total subject words which refer to the source, i.e., first person pronouns)
T-O (total subject words which refer to the receiver, i.e., second person personal pronouns)
PREP (total prepositions)
OTH (total other)
COMP (total frequency of comparison connectors)
RCl (total frequency of intransitive connectors)
L (total frequency of limiters)
Sl (total frequency of subject words)
PRIM (total frequency of primitive subject words and connectors)
TOT-2 (total words encoded less the sum of articles, preposition and other)

TOT-3 (total frequency of subject words, limiters, and connecto

These stated expectations were not meant to be limiters of the study. All syntactic categories in the SLCA-II program are of interest and were examined as possible discriminators of field dependence

2. When given a choice subjects will write about topics consistent with their cognitive style. That is, messages dealing with the fine arts and the physical sciences will discriminate between field dependent and field independent sources ($p < .05$).

3. When the source of a message and a group of receivers of that message are matched according to cognitive style, the source will be rated higher on a source evaluation scale than when the source and receivers are unmatched.

4. The message content will be perceived as more interesting when the source of a message and the receivers are matched for cognitive style than when they are mismatched.

Procedure

Subjects

One hundred sixty five subjects were selected for this study by randomly selecting classes from the 1975 Speech Communication Department list of offerings, three lower division Theatre Department courses, and from a summer mathematics seminar for high school students. Speech communication classes were utilized in conjunction with the theatre classes and mathematics seminar in order to obtain a cross section of academic majors and a relatively broad range of scores on the Hidden Figures Test Cf-1. Since field dependence-independence is developmentally stable for this age group (over fifteen, under forty), age was not felt to be a factor necessary to control.

Data Collection

If, as many suggest, the language one uses and the way in which it is used are reflections on the emotional and mental states of the user, then an examination of messages produced by individuals differing in emotion or mental states should produce linguistic and/or content variables which discriminate between the sources of the messages. This, in fact, is the rationale behind much of the content analysis work done in the social sciences. It is also the rationale for the examination of messages produced in this study. Surely one could expect to find significant differences in both the content and structure of messages produced by field dependent and field independent sources. If such differences do in fact appear, then one might reasonably expect different effects to result from different messages. Since these are essentially two different types of questions, the methods employed for the collection of data to answer each was different and occured in different stages of this study. A discussion of these stages follows.

Phase I. All subjects completed the Hidden Figures Test Cf-1 after which they completed the Self-evaluation Forms I and II. Six messages were selected from the total of messages produced

according to the following method: 1) a median split of all subjects on field dependence-independence was performed; 2) one message dealing with the fine arts produced by a subject in the upper half of the group (field independent) and one message dealing with the fine arts produced by a subject in the lower half of the group (field dependent) was selected; 3) the process was repeated for messages about the social sciences and messages about the physical sciences. The subjects who produced these messages were excluded from Phase III of the study.

To determine the category into which each message was placed, the following procedure was followed:

1. Each message was coded according to the source's field dependence score.
2. A random sample of all messages produced was drawn.
3. Five independent judges sorted the messages into the three message categories.
4. One message produced by a field dependent source and one message produced by a field independent source in each category receiving total interjudge agreement were selected for use in Phase III.

Phase II. To further test the adequacy of the Hidden Figures Test (Cf-1, the sources of the six messages chosen for use in Phase III and a pool of randomly selected subjects from both the upper and lower halves of subjects as determined by the median split mentioned above, were given the Block Design subtest of the Wechsler Adult Intelligence Scale. Each subject in this pool was scheduled for a fifteen minute session with the experimenter.

Phase III. All subjects other than the six eliminated after Phase I were assigned to twelve experimental conditions and were given an appropriate message to read. They were asked to evaluate the source of the message on the Source Evaluation Form. The subjects then rated the message content on the Message-Content Evaluation form.

Data Analysis and Results

The data collected for this study fell essentially into three categories: 1) that which provided information about syntactic categories which were thought to discriminate between field dependent subjects and field independent subjects; 2) data which provided a basis for analyzing the sources of the messages analyzed; 3) data which provided a measurement of the effects of these messages on receivers' evaluations of the message sources and the message content. The following discussion of results and techniques employed in analyzing this data adheres to this three part division.

Message Analysis. The messages produced by the subjects employed in this study were analyzed using the SLCA-II technique. A random sample of thirty subjects was selected from both the upper and lower halves of subjects. For the analysis, the six messages selected for use in Phase III were added to this random sample. Only twenty-nine of the random sample were usable in this analysis. The total number of messages analyzed with SLCA-II was thirty-five.

T-tests were computed between these two groups for syntactic category as noted in hypothesis one.* No cat found to significantly discriminate between the two gro was, consequently, no further analysis of the predictiv the categories (See Table I). The first null hypothesi cepted.

TABLE I

T-tests Between Groups for Hypothesized Syntactic Categories

	t	sig.		t
ClP	-0.21	.834	NLC1-A	1.03
S1-A	1.10	.278	NLC1-E	0.00
S1-E	0.68	.501	S-S	-0.31
LS1-A	1.01	.321	T-O	-1.38
LS1-E	0.26	.799	PREP	-0.53
LC1-A	-0.70	.491	OTH	-1.78
LC1-E	-1.04	.307	COMP	-1.89
ICE	-1.58	.123	RCL	-0.81
IT	-0.86	.397	L	0.05
IR	-0.24	.815	SL	1.15
NS1-A	1.52	.138	PRIM	-0.44
NS1-E	0.00		TOT-1	-1.27
NLS1-A	1.37	.181	TOT-2	-1.17
NLS1-E	0.36	.719	TOT-3	-0.01

df=33

Source Analysis. The issue tested here concerned or not the subject matter chosen to write about was con with the cognitive style of the source. To determine t t-test for unequal Ns was computed between the field de independence scores for subjects writing about the fine subjects writing about the physical sciences. No signi difference was found. The second null hypothesis was a (See Table II).

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*Since word index scores has a limited range from 1.00, factor scores were used for all four dependent me FD-1 scores ranged from 0 to 16, and Block Design score from 29 to 48, a z-transformation on all scores was uti meet homogeneity of variance assumptions.

TABLE II
T-test on FDI Scores by Message Topic

Message Topic	FDI Mean	N	t	sig.
Fine Arts	5.35	17	.981	.15
Physical Sciences	6.73	11		

Message Effects Analysis. To test the validity of hypotheses three and four, the cells of the original 3X2X2 design (messageXsourceXreceiver) were collapsed to produce a 2X2 design (sourceXreceiver). A two-way analysis of variance was computed for both the Source evaluations and Message Content evaluations to determine the best estimate of the population variance (See Tables IIIa and IIIb).

TABLE IIIa
Two-way ANOVA (sourceXreceiver) for Source Evaluations

Source	SS	df	MS	F	p
TOTAL	3.10	127			
Source	.169	1	.169	7.360	.01
Receiver	.028	1	.028	1.228	
SourceXReceiver	.064	1	.064	2.781	.10
Error	2.850	124	.023		

TABLE IIIb
Two-way ANOVA (sourceXreceiver) for Message Evaluations

Source	SS	df	MS	F	p
TOTAL	4.050	127			
Source	.444	1	.444	15.354	.01
Receiver	.002	1	.002	.061	___
SourceXReceiver	.008	1	.008	.264	___
Error	3.590	124	.029		

As direct tests of hypothesis three and four, the following t-tests, using the MSW for the appropriate ANOVA as the error term, were computed:

TABLE IVa
Source Evaluations

Groups	Mean	df	t	p
FD receivers X FD sources	-0.153			
		60	-2.44	.01
FD receivers X FI sources	0.005			
FI receivers X FD sources	-0.238			
		65	-5.11	.01
FI receivers X FI sources	0.425			

TABLE IVb
Message Evaluations

Groups	Mean	df	t	p
FD receivers X FD sources	-0.279			
		60	-8.19	.01
FD receivers X FI sources	0.299			
FI receivers X FD sources	-0.325			
		65	-16.78	.01
FI receivers X FI sources	0.429			

An examination of the means in each cell indicated that while the effects were significant, they were not consistent with the expected results. Consequently, hypotheses three and four were rejected.

Discussion

While none of the hypothesized expectations were confirmed, additional analysis of the data did reveal some interesting information.

1. The assumption that drawing subjects from the basic speech course would provide a wide range of field dependence-independence scores seems to have been misleading. An examination of the distribution information for this variable reveals that while the range of possible scores was sixteen points, the median response was 4.7 and the modal response was 3.00. This clustering of scores at the lower end of the distribution severly limited the range of possible outcomes. The dampening effect of such a skewed distribution is evident in the correlations tabled below:

TABLE V

Correlates	r	r2	sig.	df
FDI with Block Design	.506	.256	.002	32
FDI with Dep Meas. I	.015	.0002	.851	158
FDI with Dep Meas. II	.031	.0009	.696	158
FDI with Dep Meas. III	.055	.003	.539	127
FDI with Dep Meas. IV	.053	.003	.547	127
FDI with ACT Math	.261	.068	.028	70

Even though the correlations between field dependence-independence, Block Design and ACT Math are significant, the amount of variance explained is minimal. Previous literature leads one to expect a much higher correlation.

2. Were one to judge solely on the basis of hypothesized results in this study, the validity of the Hidden Figures Test might be questioned. Previous research, however, reports relatively high Kuder Richardson 21 coefficients (Jackson, Messick, and Myers, 1964). In addition, as anticipated, field dependence-independence did not correlate significantly with ACT scores with the exception of the math subtest.

TABLE VI
Correlations Between Field dependence-independence and ACT scores

FDI scores with	r	r2	sig.	df
ACT ENGLISH	.122	.015		70
ACT MATHEMATICS	.261	.068	.028	70
ACT SOCIAL SCIENCES	.143	.021		70
ACT NATURAL SCIENCES	.074	.005		70
ACT TOTAL	.144	.021		70

The significant correlations with the math subtest is consistent with our knowledge of field dependence-independence. A further check on the variable was provided by the correlation between field dependence-independence and block design. The results of previous research were supported in this regard. As expected the correlation, though not high, was significant (see Table V).

3. The Block Design scores appear to be better predictors in this study than field dependence-independence scores.

TABLE VII
Block Design Correlations

Block Design scores with	r	r2	sig.	df
ACT ENGLISH	.551	.303	.080	11
ACT MATHEMATICS	.712	.507	.010	11

TABLE VII (cont.)
Block Design Correlations

Block Design scores with	r	r2	sig.	df
ACT SOCIAL SCIENCES	.702	.492	.020	11
ACT NATURAL SCIENCES	.753	.567	.007	11
ACT TOTAL	.737	.543	.009	11
Dep. Measure I	.106	.011	.554	32
Dep. Measure II	.341	.116	.051	32
Dep. Measure III	-.019	.0004	.920	29
Dep. Measure IV	.339	.115	.060	29

This effect may simply be an artifact of a commonly made observation that intelligence measures are frequently the most useful predictors of human behavior available. It is interesting that the correlations between Block Design scores and two of the dependent measures are significant. Both the interest-in-subject matter scale and the message content evaluation form are evaluations of messages, though the first only indirectly. Block Design does not correlate highly with the two dependent measures which are source evaluations.

4. A rather large part of this study was concerned with an examination of written messages. Just why the first hypothesis proved so barren is not certain. There are several possible explanations. One might argue that the SLCA-II categories are not good ones, are artificial, or of little significance. On going research here at the University of Oklahoma suggests that this is unlikely since several studies have reported signigicant findings using the categories (Gorcyca, 1976; Renshaw, Gorcyca, Ritter, 1974). One might also argue that the categories are not useful for the field dependence-independence variable. Only further research can determine the validity of that argument.

Perhaps field dependence-independence is not a reliable variable. In the light of twenty years of research into field dependence-independence, however, this too seems unlikely. The explanation probably is a combination of several observations: 1) differences in cognitive style don't manifest themselves syntactically except at the extremes of the continuum; 2) this subject population was too homogenous to provide a test of the extremes; and, 3) written forms of communication may be relatively immune to individual differences in ordinary sources, at least in terms of their syntactic content.

The arbitrariness of performing a median-split on the field dependence-independence scores probably contributed greatly to the lack of significance in the first hypothesis. There is no conceptual reason to suppose that a source scoring five on the Hidden Figures Test should be significantly different from a subject scoring four.

5. The artificialness of the median split combined with the imposition of the thres message content categories might account for the lack of significance in hypothesis two. However, a look

at the distribution of field dependence-independence scores in each cell indicates a rather even distribution of extreme high and low scores. The lack of a significant correlation between field dependence-independence and scores on the self-evaluation scales coupled with the nature of the distributions of scores on these two variables indicates very little interrelationship, between cognitive style, subject matter, and self evaluations.

6. The investigation of the data analyzed for hypotheses three and four yielded some interesting results. An examination of the means of each dependent measure for each cell in the design revealed that the higher scores occured in cells where field independent cources were being evaluated. This indicates that regardless of receiver cognitive style, field independent sources and messages produced by them were preferred over field dependent sources and messages produced by field dependent sources. The lowest means occured in the cell where field independent receivers rated field dependent sources. It appears that the strongest interpersonal evaluations, both positive and negative, occur when field independent individuals do the evaluating.

An interesting item occurs the reversal of the anticipated findings for field dependent receivers. Previous research found significant positive evaluations between matched field dependent subjects. Why it was not found here is puzzling, unless field dependent sources simply don't write as well as field independent sources. We are concurrently examining the stimulus messages to determine if such a judgment is warranted.

Implications and Suggestions for Further Research

For Communication

Since the reasons for the lack of significance in regards to hypotheses one and two and for the unexpected results of hypotheses three and four are not certain, and since the conceptual bases on which this study is based still seem sound, it is appropriate to suggest further research into the area. In as much as this study was a report on research currently in progress, modification of this study can easily be made and carried out.

It seems obvious that some sort of communication effects occured in the second part of the study. Why it occured and what it means need to be pursued.

1. Extremes of the field dependence-independence continuum need to be identified and subjected to much the same sort of study. If the same results are found, it would seem appropriate to suggest that the syntactic characteristics of written messages produced by field dependent-independent sources are not sufficiently different enough to discriminate between them even at the extremes and that the results in this study were probably not a function of either a small sample or a non-normal distribution of subjects. On the other hand, if hypothesized effects are found, one might conclude that the anticipated effects dissipate in a regression toward the mean.

2. The content, other than syntactic, of the messages produced by field dependent-independent sources should be examined more carefully. If the syntactic categories aren't predictive,

perhaps some element in the message is. There is a very real possibility that we have trained all receivers, regardless of their cognitive style, personality, etc., to evaluate certain qualities in written messages to the exclusion of others, i.e., the number of main points, the clarity of the instructions, the absence of passive structures, etc.

In addition, the arbitrary classification of messages as dealing with either the fine arts, social sciences, or the physical sciences should be replaced with an unstructured Q-sort of messages. When the five judges of the messages in this study were given an opportunity to add a fourth category to their sort labeled "other", thirty percent of the messages were put into this category. It will be interesting to see what the natural distribution of topic areas is.

Of particular interest is why a reversal of effects for field dependent receivers happened in hypotheses three and four. To determine whether this a function solely of written messages this study needs to be replicated using oral messages. Should the effects found in this study be repeated, an issue of some importance will need to be raised in the cognitive style literature.

For Education

Since the source-evaluation form for hypothesis three was originally designed by Haldridge for use as a teacher evaluation instrument, it is easy to see some implications for education. All things being equal, it appears that college age subjects prefer field independent instructors, regardless of subject area. It also appears that instructional materials (i.e., textbooks) prepared by field independent sources might be preferred.

This is contrary to reported findings in the cognitive style literature and needs to be examined carefully. This phase of the study should be refined so that more precision is possible in determining whether this is a function of a sourceXsubject matterX-receiver interaction. It should also be studied in a true educational setting, that is, with real instructors giving real instructions (teaching) to real classes of students.

Conclusion

Though syntactic categories in this study did not prove to be good discriminators of field dependence-independence, there were obviously some message effects working. What they were and why they produced unexpected results for field dependent receivers needs close analysis.

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